

depended upon the character of the matter previously soiled the plates, and which may easily be supposed to be sometimes of such a nature as to be removed by these acids, and at other times not. Weak sulphuric acid showed the same difference, but strong sulphuric acid (337) never failed in its action.

341. The most favourable treatment, except that of making the plate a positive pole in strong acid, was as follows. The plate was held over a spirit-lamp flame, and when hot, rubbed with a piece of potassa fusa (caustic potash), which melted, covered the metal with a coat of very strong alkali, and it was retained fused upon the surface for a second or two: it was then put into water for four or five minutes to wash off the alkali, shaken, and immersed for about a minute in hot strong oil of vitriol; from this it was removed into distilled water where it was allowed to remain ten or fifteen minutes to remove the last traces of acid (318). Being then put into a mixture of oxygen and hydrogen, combination immediately began, and proceeded rapidly; the tube became warm, the platina became red hot, and the residue of the gases was inflamed. This effect could be repeated at pleasure, and thus the maximum phenomenon could be produced without the aid of the voltaic battery.

342. When a solution of tartaric or acetic acid was substituted in this mode of preparation, for the sulphuric acid, still the plate was found to acquire the same power, and would of course produce explosion in the mixed gases; but the strong sulphuric acid was most certain and powerful.

343. If borax, or a mixture of the carbonates of potash, soda, be fused on the surface of a platina plate, and that plate be well washed in water, it will be found to have acquired power of combining oxygen and hydrogen, but only in a moderate degree; but if, after the fusion and washing, it be dipped in the hot sulphuric acid (337), it will become active.

344. Other metals than platina were then experimented with. Gold and palladium exhibited the power either when made the positive pole of the voltaic battery (306), or when acted on by hot oil of vitriol (337). When palladium is used, the action of the battery or acid should be moderated, as that met-

soon acted upon under such  
circumstances. Silver and gold  
could not be made to show any effect at  
common temperatures.

<sup>1</sup> The heat need not be raised so much as to make the  
alkali platina, although if that effect does take place it does  
not prevent ultimate action. <sup>tarnish!</sup>